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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,738	09/04/2003	Deniz Senturk	133667-1	5233

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
KARDOS, NEIL R	

ART UNIT	PAPER NUMBER
3623	

NOTIFICATION DATE	DELIVERY MODE
11/21/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/654,738	SENTURK ET AL.	
	Examiner	Art Unit	
	Neil R. Kardos	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-33* is/are pending in the application.

4a) Of the above claim(s) *12-28,30 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,29,32 and 33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/12/08 (1), 8/12/08 (2)*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is a **FINAL** Office action on the merits in response to communications filed August 12, 2008. Claims 1 and 29 have been amended. Claim 11 has been cancelled. Claims 32-33 have been added. Claims 12-28 and 30-31 were previously withdrawn. Currently, claims 1-10, 29, and 32-33 are pending and have been examined.

Response to Amendment

2. Applicant's amendments to claims 1 and 29 and the addition of claims 32 and 33 have been acknowledged. The amendments to claim 1 are sufficient to overcome the § 101 rejection set forth in paragraph 7 of the previous Office action. However, the amendments to claim 29 are not sufficient to overcome the § 112 and § 101 rejections set forth in the previous Office action. These rejections are reiterated below.

Response to Arguments

3. Applicant's arguments filed on August 12, 2008 have been fully considered but they are not persuasive. Applicant argues the following:

(A) Hunter fails to teach or suggest trending by deriving a standardized score that pertains to a variance of a predicted value with respect to other predicted values in a specified time interval (see Response, page 12).

(B) Hunter fails to teach or suggest de-trending to reduce the error in the predicted value based on the standardized score calculated in the trending logic and a consideration of actual values associated with the specified time interval.

4. Regarding argument (A), Examiner respectfully disagrees. First, the test for obviousness is not that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The claimed trending operation determines a variance amongst predicted values. Hunter teaches using predictions for similar products to reduce the error in predictions for new products. In statistics, predictions about a population are made using similar populations because it is assumed that the populations share many of the same characteristics, including statistical characteristics such as variance (see Hunter ¶¶ 33-34, disclosing the benefits of making predictions using similar populations). Hunter also teaches using conventional surveying and sampling techniques to collect prediction data (see ¶¶ 10 and 31) and using "sophisticated statistical (e.g. regression) analysis" on the collected data (see ¶ 11; see also ¶ 39). Finally, Hunter discloses removing outliers in the collected data set using statistical analysis (see ¶ 36). Variance is commonly used as a statistical tool to remove outliers. Thus, Hunter suggests deriving a standardized score that pertains to a variance of predicted values.

Even if Hunter did not suggest deriving the claimed trending operation, it would at least be obvious for one of ordinary skill in the art to try the claimed trending operation. One of ordinary skill in the art would have been motivated to try the claimed trending operation to compare similarities between the predictions for the "similar" products and the "new" products in order to obtain a more accurate prediction.

Finally, the limitations recites an intended use of the trending operation. The positively recited portion of the limitation reads "performing a trending operation using trending logic

provided by the electronic data processing apparatus." The intended use portion of the limitations reads "to derive a standardized score that pertains to a variance of the predicted value with respect to other predicted values generated using the model in a specified time interval." A recitation of the intended use of the claimed invention must result in a functional difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Here, Hunter's trending operation is capable of deriving a standardized score pertaining to a variance of the predicted values because Hunter suggests removing outliers from the predictions.

5. Regarding argument (B), Examiner respectfully disagrees. As shown above, Hunter suggests deriving a standardized score that reduces the error in the predicted values. Hunter suggests this through the use of similar data sets (e.g. data sets with similar statistical characteristics, including variance) and the removal of outliers, both of which serve to reduce prediction errors. Hunter also teaches reducing error by considering actual values (see ¶¶ 30-32). Thus, Hunter suggests this limitation.

Even if Hunter did not suggest deriving the claimed de-trending operation, it would at least be obvious for one of ordinary skill in the art to try the claimed de-trending operation. One of ordinary skill in the art would have been motivated to try the claimed de-trending operation to compare similarities between the predictions for the "similar" products and the "new" products in order to obtain a more accurate prediction.

Furthermore, the limitations recites an intended use of the de-trending operation. The positively recited portion of the limitation reads "performing a de-trending operation using de-

trending logic provided by the electronic data processing apparatus." The intended use portion of the limitations reads "to reduce the error in the predicted value based on the standardized score calculated in the trending logic and a consideration of actual values associated with the specified time interval." A recitation of the intended use of the claimed invention must result in a functional difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Here, Hunter's de-trending operation is capable of reducing error in the predicted value because Hunter teaches removing outliers and using similar data sets.

Finally, the claimed de-trending operation is unclear because it recites considering actual values associated with the specified time interval that is also associated with the predicted values. The specification describes that these "actual" values represent events that will happen in the future; thus, they are calculated based on "actual observed values" (see ¶ 79). Examiner recommends that Applicant amend this limitation to clearly recite the functionality of the de-trending operation.

6. In regards to claims 2-3, Examiner notes that Applicant has failed to traverse Examiner's Official Notice, which was originally set forth in the previous Office action. Therefore, Examiner's findings of Official Notice are taken to be admitted prior art. See MPEP § 2144.03 (C).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 29 and 32-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29: Claim 29 recites a "computer-readable medium storing a system." Examiner believes that Applicant is trying to claim either (1) a computer-readable medium storing program code that, when executed by a computer, causes the computer to perform various steps, or (2) a system comprising various components. However, from the language of the claim, it is not clear which of these is being claimed. Further, if a computer-readable medium is being claimed, it is not clear that the computer-readable medium actively causes a computer to perform various steps. If a system is being claimed, it is not clear how the various claimed elements constitute a physical system (i.e. they could be software). The limitation "a computer-readable medium storing a system" does not make sense because a system is thought of as comprising physical structures which cannot be stored on a computer-readable medium. Clarification is required.

Claims 32-33: Dependent claims 32-33 are rejected for failing to remedy the deficiencies of the claims from which they depend.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. **Claims 29 and 32-33 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Claim 29: As discussed in the § 112 rejection above, it is not clear whether the claim is directed to a computer readable medium or a system. A system must constitute a physical structure. The elements recited in the claim do not necessarily constitute a physical structure, such as computer hardware. Rather, they could be software. The claim does not recite any physical structures necessary to constitute a system. Therefore, the claimed invention does not fall within a statutory class of patentable subject matter.

Claims 32-33: Dependent claims 32-33 are rejected for failing to remedy the deficiencies of the claims from which they depend.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. **Claims 1-7, 29, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. pre-grant publication number 2004/0064357 to Hunter et al ("Hunter") in view of U.S. pre-grant publication number 2004/0088211 to Kakouros et al ("Kakouros").**

Claims 1 and 29: Hunter discloses a method and apparatus for performing business-related analysis using an electronic data processing apparatus based on an incomplete dataset, comprising:

- providing a model implemented on an electronic data processing apparatus that is based on an incomplete dataset (see paragraphs 9, 11, and 32, disclosing correcting data analysis where data is not available);
- generating a predicted value, using the model, that contains an error attributed to information that is missing from the incomplete dataset (see paragraphs 9, 11, 30, and 32, disclosing correcting a predicted consumer behavior forecast);
- performing a trending operation using trending logic provided by the electronic data processing apparatus to derive a standardized score that pertains to a variance of the predicted value with respect to other predicted values generated using the model (see paragraph 30, disclosing determining the spread/divergence between forecasted consumer purchasing behavior and actual consumer purchasing behavior for a similar product; see also Response to Arguments above); and
- performing a de-trending operation using de-trending logic provided by the electronic data processing apparatus to reduce the error in the predicted value based the standardized score calculated in the trending logic and a consideration of actual values, the de-trending operation (see paragraph 32, disclosing applying the correction factor obtained in the trending step to reduce the error in the predicted value; see also Response to Arguments above); and

- yielding an electrical signal representative of an output result that includes probability information associated with the output result (see at least ¶ 32).

Hunter does not explicitly disclose wherein the trending and de-trending operations occur in a specified time interval.

Kakouros teaches forecasting period of various lengths (see paragraph 66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the forecasting windows taught by Kakouros to the predictions disclosed by Hunter. One of ordinary skill in the art would have been motivated to do so for the benefit of increasing the accuracy of evaluation metrics (see Kakouros: paragraph 66).

Claim 2: Hunter does not explicitly disclose wherein the trending operation comprises:

- computing a predicted mean of a collection of predicted values within the specified time interval;
- computing a predicted standard deviation of the predicted values within the specified time interval; and
- computing the standardized score by subtracting the predicted mean from the predicted value to produce a difference, and dividing the difference by the predicted standard deviation.

One of ordinary skill in the art would recognize this limitation as the computation of a standard z-score with the equation $z = (x - m) / s$, where x is the score to be standardized, m is the mean of the population, and s is the standard deviation of the population (see e.g. Wikipedia: Standard Score). Examiner takes Official Notice that it was well-known to one of ordinary skill

in the statistical arts at the time the invention was made to standardize values using a z-score and its associated equation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use well-known statistical techniques to determine the spread/divergence disclosed by Hunter. One of ordinary skill in the art would have been motivated to do so for the benefit of conforming with statistical standards.

Claim 3: Hunter does not explicitly disclose wherein the de-trending operation comprises:

- computing an actual mean of the actual values within the specified time interval;
- computing an actual standard deviation of the actual values within the specified time interval; and
- computing the output result by multiplying the standardized score by the actual standard deviation to produce a product, and adding the actual mean to the product.

One of ordinary skill in the art would recognize this limitation as the computation of a standardized value using a z-score with the equation $x = zs + m$, where z is the standardization factor, m is the mean of the population, and s is the standard deviation of the population (see e.g. Wikipedia: Standard Score). This equation is an algebraic equivalent of the equation used in claim 2. Examiner takes Official Notice that it was well-known to one of ordinary skill in the statistical arts at the time the invention was made to standardize values using a z-score and its associated equation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use well-known statistical techniques to determine an adjusted value based on the spread/divergence disclosed by Hunter. One of ordinary skill in the art would have been motivated to do so for the benefit of conforming with statistical standards.

Claim 4: Hunter discloses collecting the dataset from a business operation (see paragraphs 9, 11, 30, and 32, disclosing collecting predicted and actual consumer behavior).

Claim 5: Hunter discloses wherein the business operation includes multiple stages (see paragraph 12, disclosing using the technique at various stages of the business cycle).

Claim 6: Hunter discloses controlling the business operation based on the output result (see paragraph 3, disclosing reducing the risk of introducing products and services; paragraph 4, disclosing deciding whether to proceed to the next stage of introducing or marketing a new product; paragraph 5).

Claim 7: Hunter discloses wherein the incomplete dataset contains at least 30 percent missing information relative to a total population of potential information (see paragraph 15, disclosing NO or inadequate data).

Claims 32-33: Claims 32-33 are substantially similar to claims 2-3 and are rejected under similar rationale.

10. **Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunter in view of Kakouros, and further in view of U.S. pre-grant publication number 2004/0054600 to Shike et al ("Shike").**

Claim 8: Hunter does not explicitly disclose wherein the business-related analysis pertains to a business operation in which vehicles are leased to customers, and wherein the dataset stores cycle time values that reflect the respective amounts of time for which the customers lease the vehicles.

However, Hunter does generally disclose predicting consumer behavior, which can be applied to a variety of fields.

Shike teaches a rental system where vehicles are rented to customers and vehicle return dates are predicted and stored (see paragraph 271).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the prediction techniques of Hunter to a vehicle rental or leasing business as taught by Shike. One of ordinary skill in the art would have been motivated to do so for the benefit of adapting the prediction model to be compatible with a specific business.

Claim 9: Hunter does not explicitly disclose wherein missing information from the incomplete dataset corresponds to vehicles that have not yet been returned by respective customers, and thus for which the cycle time values are not yet determined.

However, Hunter does generally disclose predicting consumer behavior with unknown data, which can be applied to a variety of fields.

Shike teaches a rental system with known and unknown predicted return dates (see paragraphs 271-277; specifically, paragraph 274, disclosing an "unknown" return date).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the unknown rental return date taught by Shike for the unknown demand taught by Hunter. One of ordinary skill in the art would have been motivated to do so for the benefit of adapting the prediction model to be compatible with a specific business.

Claim 10: Hunter does not explicitly disclose wherein the predicted value pertains to an estimate of when a customer will return a leased vehicle.

However, Hunter does generally disclose predicting consumer behavior, which can be applied to a variety of fields.

Shike teaches a rental system where vehicles are rented to customers and vehicle return dates are predicted and stored (see paragraph 271).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the estimated return date taught by Shike for the consumer demand taught by Hunter. One of ordinary skill in the art would have been motivated to do so for the benefit of adapting the prediction model to be compatible with a specific business.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neil R. Kardos whose telephone number is (571) 270-3443. The examiner can normally be reached on Monday through Friday from 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Beth Boswell can be reached on (571) 272-6737. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Neil R. Kardos
Examiner
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11/18/08
/Jonathan G. Sterrett/
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